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## iPS developments - faster creation, but questions raised

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Two pieces of news came out today about reprogrammed iPS cells - one showing a new way of making them and the other suggesting that they may not be all they're cracked up to be.

First, the new technique. A team at Sanford-Burnham Medical Research Institute in La Jolla figured out a way of removing barriers to reprogramming, in which skin or other adult cells are reprogrammed back to an embryonic-like state. Most techniques for reprogramming involving adding DNA or other factors to push the cells back in developmental time. But the process isn't very efficient. This team identified two barriers to reprogramming and removed them using small inhibitory molecules called miRNAs.

The Sanford-Burnham press release quotes CIRM grantee Evan Snyder, director of Sanford-Burnham's Stem Cells and Regenerative Biology program:

“Up until now, cellular differentiation and de-differentiation has focused principally on the expression of genes; this work indicates that the strategic non-expression of genes may be equally important. The work has demonstrated that miRNAs do function in the reprogramming process and that the generation of iPSCs can be greatly enhanced by modulating miRNA action. In addition to helping us generate better tools for the stem cell field, such findings inevitably facilitate our understanding of normal and abnormal stem cell behavior during development and in disease states.”

Ironically, on the same day the authors published the fruits of many years of labor, the news cycle delivered a blow. Researchers down the road at The Salk Institute for Biological Studies published yet another report showing critical differences between iPS and embryonic stem cells. There's been a steady drumbeat over the past year of studies pointing out that iPS cells might not exactly mimic embryonic stem cells, and for that reason might not be ideal replacements in therapies.

William Lowry, a CIRM grantee at UCLA, is quoted in a Nature news story about the finding:

“The problem is that we don't know if any of these differences are going to be consequential.”

Whether these differences between iPS and embryonic stem cells will turn out to be insurmountable in terms of future therapies is unknown. What is clear is that scientists have many hours in the lab ahead of them before we understand which cells are the safest and most effective for eventual therapies.

- A.A.

Tags: Lowry, iPS, Salk Institute, snyder, Sanford-Burnham

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